A brief history of the University of Canterbury's Observatory at Mt John

The Mt John University Observatory was officially opened on 10 July 1965 as a joint endeavour between the Universities of Pennsylvania and Canterbury. Extensive testing throughout New Zealand in the early 1960s had established the site as one of the best in the country for astronomical observations due to its large number of clear nights and its dark skies free from light pollution.

The observatory's early instruments were astronomical cameras (astrographs) provided by Pennsylvania and telescopes lent by Frank Bateson, the first Astronomer-in-Charge. In 1970 the 0.60-m Optical Craftsmen telescope (the 'OC') was installed. In 1975 a second 0.60-m telescope, made by Boller and Chivens (the 'B&C'), was erected. From about 1975 the contribution and interest of the U.S. partners waned as their senior staff retired. The Observatory now operates entirely as a field station of the University of Canterbury's Department of Physics and Astronomy.

From 1969-1983 the U.S. Air Force operated a satellite tracking station in the building to the south of the Observatory. When this closed in 1983, the University of Canterbury added a large dome to house its new 1.0-m McLellan telescope. The telescope was built in the University of Canterbury's workshops and installed at Mt John in February 1986.

The 'One Metre building' accommodates visiting staff and observers.

The largest telescope in New Zealand, the 1.8-m MOA (Microlensing Observations in Astrophysics) telescope, was opened in 2004. The telescope and dome were commissioned by the University of Nagoya and the building was constructed by the University of Canterbury. The telescope is currently operated by the MOA collaboration, which is a joint project between the University of Nagoya and Canterbury, Auckland, Massey and Victoria Universities in New Zealand.

As services to the local community the Observatory hosts Vodaphone cellphone antennae and a FM repeater for National Radio. Near the summit is a GPS station run by the Institute of Geological and Nuclear Sciences and the Survey Department of Otago University. It is the base station for measuring bending of the South Island around the Alpine Fault. A webcam run by Tekapo Tourism shows views of the Mackenzie.

Earth & Sky Limited, a Tekapo company, built a café with conservatory round the old Bamberg camera building in 2006. They have also installed a 40-cm telescope for public viewing in the University of Canterbury's '16-inch' dome. The company runs daytime and nighttime tours of the Observatory.

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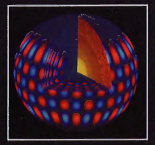
CHRISTCHURCH NEW ZEALAND

Astronomy Research

UC SCIENCE

Astronomy and Astrophysics Research at Mt John

'The Music of the Stars'



Every star has a unique vibrational pattern, which depends on its internal structure. Using the 1.0-m telescope, UC astronomers detect and study these tiny surface motions (or 'star quakes') to infer the internal structure of the stars. This is similar to the way in which seismologists study the internal structure of the Earth by using earthquakes.

Searching for planets around nearby stars

Stars can 'wobble' slightly in the sky as they are tugged by the gravity of any orbiting planets. UC astronomers study these tiny motions to detect these planets and to determine properties such as how many, how big and how far away these planets are from their parent stars.

Tracking Near-Earth Objects (NEOs)

Near-Earth Objects are small rocky or icy objects in orbits that pass close to Earth's orbit. These objects could pose a threat to Earth if they come too close, so UC astronomers have an ongoing project to discover, and accurately track, these objects.

Telescopes and Instruments at the University of Canterbury's Mt John University Observatory

The 1.0-m McLellan telescope

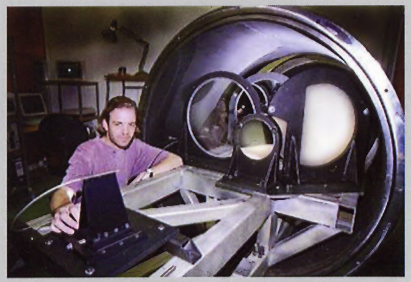
The 1.0-m telescope was built in the University of Canterbury's workshops and was installed at Mt John in February 1986.

This telescope is used for many different research projects. It can be used in direct imaging mode to take precise scientific images of astronomical objects.

The light from the telescope can also be guided via a fibre-optic cable to the HERCULES spectrograph – a sophisticated and cutting edge instrument that was designed and built in the Department of Physics and Astronomy.

The HERCULES spectrograph

The HERCULES spectrograph is a powerful instrument that provides astronomers with detailed information about the stars, such as their temperatures, compositions, sizes and motions.



The 1.8-m MOA telescope

The MOA telescope is currently dedicated to surveying our Galaxy to find stars that vary in brightness due to the gravitational microlensing effect. This technique is used to detect extra-solar planets and has discovered several planets orbiting distant stars in our Milky Way galaxy. MOA is a Japanese-New Zealand collaboration.

The two 0.6-m telescopes

These two small telescopes are used to detect variations in the brightnesses of certain stars. Brightness variations can be due to: the star pulsating; two stars eclipsing each other in a binary system; explosions or eruptions on the star; or magnification by the gravitational lensing effect.

In association with the AAVSO (American Association of Variable Stars Observers), the OC telescope has recently been converted to a robotic telescope. It will automatically observe a set sequence of pre-programmed stars each clear night.

The B&C telescope is used by the MOA collaboration for observing interesting microlensing events due to planets. This telescope is also used by Earth and Sky Ltd for public viewing.